REMARKS

Claims 1 through 16 were pending in this Application. Claim 1 has been amended and dependent claim 17 has been added. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure. Applicant submits that the present Amendment does not generate any new matter issue. It is believed that the present amendment places the application in condition for allowance. Accordingly, entry of the present amendment is solicited.

Claims 1 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Buche et al. (WO 03/058735, hereinafter "Buche") in view of Koschany et al. (U.S. Pat. No. 6,451,470, hereinafter "Koschany"). Applicant respectfully traverses.

Claims 2-4 and 10-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Buche in view of Koschany and further in view of Terazono et al. (U.S. Pat. App. Pub. No. 2002/0009626, hereinafter "Terazono"). Applicant respectfully traverses.

Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yasumoto et al. (JP 2000-243404, hereinafter "Yasumoto") in view of Koschany. Applicant respectfully traverses.

Claims 2-4 and 10-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yasumoto in view of Koschany and further in view of Terazono. Applicant respectfully traverses.

In the fuel cell electrode according to independent claim 1 of the present application, the gas diffusion layer includes a first carbon particle and second carbon particle. The content of the second carbon particle in the gas diffusion layer is in the range of 3wt.% to 30wt.% with respect to a weight of the entire gas diffusion layer. Since the second carbon particle has a water-repellent surface, introduction of the particle secures a gas path on the surface of the carbon

particle, which is not coated with moisture. However, if the particle is added in too small of an amount, the advantage is insufficient. Further, if the amount is too large, not only does the gas path fail to grow more, but the thickness of the gas diffusion layer is increased unnecessarily, thereby degrading the gas diffusion capability.

As shown in Fig. 2 of the present application, by including the highly graphitized carbon particle 101 (the second carbon particle) in the gas diffusion layer 32, water existing in the gas diffusion layer 32 is efficiently discharged outside the air electrode 24. A gas path is secured in the proximity of the surface of the second carbon particle. Also, since the carbon particle 105 (the first carbon particle) has a hydrophilic surface, appropriate water retention is performed in the gas diffusion layer 32 when the first carbon particle is included in the gas diffusion layer 32 and a moisture discharging path is formed. Further, because of the existence of the first carbon particle and the second carbon particle, conductivity of the gas diffusion layer 32 is improved. Accordingly, the gas diffusion layer 32 attains excellent electrode characteristics because of the high moisture discharging efficiency, appropriate water retention and high conductivity.

Turning to the prior art, Buche, Yasumoto and Koschany do not disclose setting the content of the second carbon particle in the gas diffusion layer, as required in claim 1. As admitted by the Examiner at pages 3 and 5 of the Office action, Buche and Yasumoto do not teach a gas diffusion layer that includes a first carbon particle and second carbon particle. The secondary Koschany reference relied upon by the Examiner, teaches at Example 2 that with respect to the gas diffusion layer, three carbonized carbon fiber nonwoven fabrics of a mass of 3 mg/cm^2 are used as starting materials. The final mass of the first nonwoven fabric is 10 mg/cm^2 so that the mass of graphite in the first nonwoven fabric is 7 x 0.07 = 0.49 mg/cm^2. The final mass of the second nonwoven fabric is 16 mg/cm^2 so that the mass of graphite in the second nonwoven fabric is 13 x 0.4 = 5.2 mg/cm^2. The final mass of the third nonwoven fabric is 19 x

$0.8 = 15.2$ mg/ cm^2. The mass of graphite in the stack of these three nonwoven fabrics is $0.49 + 5.2 + 15.2 = 20.89$ mg/ cm^2. The overall mass of the nonwoven fabric is $10 + 16 + 22 = 46$ mg/ cm^2. The content of water-repellent graphite is $20.89/48 \times 100 = 43.5$wt.%, which exceeds the range required in amended claim 1. If this excessive amount of graphite content is used in the present gas diffusion layer, the thickness of the gas diffusion electrode is undesirably increased (as noted above), thereby making it difficult to ensure the gas diffusion capability. Accordingly, independent claim 1 is not obvious over the applied prior art of record and Applicant respectfully request reconsideration and withdrawal of the obviousness rejections.

Dependent claims 2-4 and 9-12 are free from the applied art in view of their respective dependencies from claim 1. The reference to Terazono does not cure the previously argued deficiencies of Buche/Koschany and Yasumoto/Koschany. Accordingly, reconsideration and withdrawal of the rejections are solicited.

With respect to newly added claim 17, the content of the first carbon particle in the gas diffusion layer is in the range of 1wt.% to 20wt.% with respect to a weight of the entire gas diffusion layer. Since the first carbon particle has a hydrophilic surface, introduction of he particle secures a moisture moving path on the surface of the carbon particle. As a result, excess moisture in the gas diffusion layer is removed so that gas diffusion capability is improved. However, if the particle is added in too small of an amount, the advantage is insufficient. If the amount is too large, not only does the moisture moving path not grow, but also the thickness of the gas diffusion layer is unnecessarily increased, thereby degrading gas diffusion capability.

The applied prior art does not disclose or suggest setting the content of the first carbon particle in the gas diffusion layer as required in claim 17. The secondary Koschany reference relied upon by the Examiner, teaches at Example 2 that with respect to the gas diffusion layer, mass of soot in the first nonwoven fabric is $7 \times 0.63 = 4.41$ mg/cm^2. The mass of soot in the

second nonwoven fabric 13 x 0.3 = 3.9 mg/ cm^2. The mass of soot in the third nonwoven fabric is 19 x 0.1 = 1.9 mg/ cm^2. Therefore, the content of hydrophilic soot is 10.21/48 x 100 = 21.3wt.%, which exceeds the range required in amended claim 17. If this excessive amount of soot content is used in the present gas diffusion layer, the thickness of the gas diffusion electrode is undesirably increased (as noted above), thereby making it difficult to ensure the gas diffusion capability.

Based upon the foregoing it should be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, solicited. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicant's representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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